



**Natural Resources Conservation Service**  
**CONSERVATION PRACTICE STANDARD**  
**PRECISION LAND FORMING AND SMOOTHING**

**CODE 462**

**(ac)**

**DEFINITION**

Regrading of a field to remove surface irregularities.

**PURPOSE**

This practice is used to accomplish one or more of the following purposes:

- Improve surface drainage
- Reduce erosion
- Improve equipment operation and efficiency

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to fields where depressions, mounds, old terraces, turnrows, and other surface irregularities interfere with or adversely affect surface drainage, erosion control, and equipment operation. This standard does not apply to land leveling for irrigation. Refer to NRCS Conservation Practice Standard (CPS) Irrigation Land Leveling (Code 464) for this purpose.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Plan, design, and construct this practice to comply with all Federal, State, and local laws and regulations.

Notify the landowner and/or contractor of their responsibility to locate all buried utilities in the project area, including drain tile and other structural measures. The landowner is required to obtain all necessary permits for project installation prior to construction.

Plan and design this practice based on engineering surveys and investigations as part of a conservation system to address the resource concerns for the field. If the practice is applied for more than one purpose, it must meet the requirements of the most restrictive purpose.

The grading plan must include other practices necessary to address resource concerns, such as NRCS CPSs Grassed Waterway (Code 412), Surface Drain, Field Ditch (Code 607), and Filter Strip (Code 393).

**Grading plan**

Develop a grading plan with uniform slopes to allow drainage across the field. Plan grades within the limits needed to avoid excessive erosion. Use current NRCS erosion prediction technology to determine acceptable grades and maximum slope lengths. In areas subject to wind erosion, use current NRCS wind erosion prediction methods for determination of wind erosion and include practices necessary to limit it.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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NRCS, NHCP  
July 2021

Avoid reverse grades. Short level sections are permissible. Remove irregularities to the extent needed for the planned land use. When the elevational differences between two field plots exceeds 1 foot, include a permanent grassed or soil border between the plots.

The soil in fields where this practice is applied must be of sufficient depth and suitable texture to accommodate the planned land use after the practice is applied. If this cannot be achieved the area should be topsoiled to a depth consistent with the planned land use.

### **Cut and fill computations**

Balance cuts and fills for the grading plan. Include any fill or excavation necessary for ditches, pads, and roadways that are part of the plan. Grade tolerances for final grades must meet the requirements of the planned land use.

### **Surface drainage**

Precision land forming and smoothing systems must include drainage practices for handling runoff without excessive erosion. Designs must include features to carry runoff to a stable outlet.

### **Erosion and dust control**

Plan construction operations to limit erosion and dust generation. Include any practices necessary during earth moving activities to control erosion and dust and adverse effect on adjacent areas.

## **CONSIDERATIONS**

This practice can affect the water budget, especially volumes and rates of runoff, infiltration, deep percolation, and evaporation. This includes effects on wetlands and wildlife as well as ground water recharge. Consider these effects when designing the practice and include any mitigation actions that may be necessary in the final plans.

Consider effects on soil health and soil erosion due to physical disturbance of the soil and take the necessary steps to minimize such disturbance.

Consider temporary vegetation for cropland and permanent vegetation for noncropland. Refer to NRCS CPSs Cover Crop (Code 340) and Critical Area Planting (CPS 342), respectively.

Earth moving activities can uncover saline or other toxic soils. Consider how these soils will be removed, reburied, mitigated, or otherwise safely disposed of so that crop or forage production is not adversely impacted.

## **PLANS AND SPECIFICATIONS**

Provide plans and specifications that describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include—

- A plan view showing the location and extent of the practice.
- A grading plan showing final grades and cut and fill quantities.
- Typical cross sections.
- Details for any other conservation practices to be installed.

## **OPERATION AND MAINTENANCE**

Prepare a written operation and maintenance (O&M) plan for the landowner to ensure that the practice functions as intended. As a minimum, the O&M plan must include—

- Annual inspections and after significant storm events to ensure that planned grades and contours are maintained.
- Timely repair of any damages found.

**REFERENCES**

USDA NRCS. 2008. National Engineering Handbook (Title 210), Part 650, Chapter 1, Surveying. Washington, D.C. <https://directives.sc.egov.usda.gov/>

USDA NRCS. 2001. National Engineering Handbook (Title 210), Part 650, Chapter 14, Water Management (Drainage). Washington, D.C. <https://directives.sc.egov.usda.gov/>

USDA NRCS. 1990. National Engineering Handbook (Title 210), Part 650, Chapter 4, Elementary Soils Engineering. Washington, D.C. <https://directives.sc.egov.usda.gov/>

USDA NRCS. 1983. National Engineering Handbook (Title 210), Section 15, Chapter 12, Land Leveling. Washington, D.C. <https://directives.sc.egov.usda.gov/>